APPENDIX B

PROPOSED FLOW REGIME FOR THE RUSSIAN RIVER IMPLEMENTATION PLAN AND PROPOSED PERMIT TERMS

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Term	*Definition*
AF	acre-feet
BA	Biological Assessment
cfs	cubic-feet per second
Estuary	Russian River Estuary
MGD	million gallons per day
OEI	optimal Estuary inflow
SCWA	Sonoma County Water Agency
SWRCB	State Water Resources Control Board
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

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B.1.0 Introduction

This plan describes in detail the operational criteria that the Sonoma County Water Agency (SCWA) intends to follow to: 1) comply with the minimum stream flow requirements expected to be prescribed by the State Water Resources Control Board (SWRCB) via amendment of the terms of the SCWA's appropriative water rights permits, and 2) achieve the additional anadromous fishery enhancement objectives of the SCWA's proposed flow regime. This plan describes the criteria for the proposed water rights terms, including the specific minimum flow requirements. Actual flow rates under typical operation of the system are usually higher than the minimum flow rates required by the permit terms. For a more detailed discussion of the flow rates predicted to occur under the Flow Proposal, please refer to sections 4.3 and 5.3.

B.2.0 Minimum Lake Mendocino Releases

The minimum stream flow requirements for the Russian River from Coyote Valley Dam to its Dry Creek confluence are listed in Table B-1:

Table B-1 Minimum Stream Flow Requirements for the Upper and Middle Russian River in cfs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Normal	150	150	150	100	100	50	50	50	50	50	150/ 75[1]	150/ 75[1]
Dry	75	75	75	75	75	50	50	50	50	50	75	75
Critical	25	25	25	25	25	25	25	25	25	25	25	25
Dry Spring	150	150	150	100	100	50	50	50	50	50	75	75
East Fork	25	25	25	25	25	25	25	25	25	25	25	25

[1] 75 cfs when storage in Lake Mendocino is less that 30,000 AF

The flows labeled as "East Fork" are the minimum flows that apply to the East Fork Russian River between Coyote Dam and its confluence of the West Fork Russian River (the Forks). All the other minimum flows apply to the Russian River from the Forks to its confluence with Dry Creek. Normal minimum flow requirements apply when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is greater than 130,000 acre-feet or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less. Under these requirements, anytime between November 1 through December 31 storage in Lake Mendocino is less than 30,000 acre-feet, the required minimum flow rate is reduced from 150 cfs to 75 cfs. Dry Spring applies during normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 acre-feet or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less.

During those periods when the U.S. Army Corps of Engineers (USACE) is not making releases for flood control purposes, SCWA determines releases from Lake Mendocino. Releases are made during these times, typically during the summer and fall, to maintain the minimum flows listed in Table B-1. Additional releases are made from Lake

Mendocino in accordance with the criteria described in the following sections to satisfy the water supply needs of SCWA and achieve the anadromous fishery objectives of the proposed flow regime.

B.3.0 Lake Mendocino Operating Criteria

Under the water rights permit terms prescribed by Decision 1610 of the SWRCB, SCWA's operating criteria contained no decision logic to base releases from Lake Mendocino on flow conditions in the lower Russian River. However, the proposed flow regime requires just this type of operation. Thus, under the proposed flow regime, the operator must consider not only flow conditions in the upper and middle Russian River (typically controlled at Healdsburg) in deciding the necessary release rate from Lake Mendocino, but also consider information to help the operator anticipate what the conditions in the lower Russian River will be and make releases from Lake Mendocino accordingly.

To do this, the operator considers the "target flows" for the mouth of Dry Creek, Santa Rosa hydrologic subunit monthly demands (which are largely SCWA's transmission system demands), the Santa Rosa subunit tributary inflows, the lower Russian River natural flows (as defined in the proposed water rights permit terms), and lower Russian River transition flows (as defined in the proposed flow regime). This information allows the operator to estimate the flow rates that need to be maintained at Healdsburg in order to attain a specific target flow range in Dry Creek while meeting the water supply demands and the minimum stream flow rates required at the Hacienda Bridge. The target flow rates for Dry Creek are listed in Table B-2.

Table B-2 Target Flow Rates for the Mouth of Dry Creek in cfs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Normal	75	75	75	70	70	70	70	70	70	50	105	105
Dry	75	75	75	70	70	70	70	70	70	70	75	75
Critical	200	200	200	200	200	200	200	200	200	200	200	200
Dry Spring	75	75	75	70	70	70	70	70	70	70	105	105

The operator accomplishes this by first calculating the appropriate minimum flow for the lower Russian River by considering which of the following three conditions will likely prevail:

1. the sand bar is closed and the optimal estuary inflow is the minimum flow (90 cfs<$Q_{Hacienda}$<150 cfs and the month is from April through October);
2. the sandbar is closed and the natural flow is the minimum flow down to the absolute minimum flow rate of 35 cfs (35 cfs<$Q_{Hacienda}$<90 cfs) or;
3. the sandbar is open and the transition flow is the minimum flow ($Q_{Hacienda}$>150 cfs).

At the U.S. Geological Survey (USGS) stream flow gauging station Russian River near Guerneville, California the specified minimum flow rate refers to a five-day running

average flow rate (with the instantaneous flow rate never less than 10 cfs below the specified minimum flow requirement).

The parenthetical comments above are assumptions made here for illustrative purposes. In this example (and in SCWA's computer modeling of the impacts of the proposed flow regime) it is assumed that the closure of the estuary will take place whenever the flow at Hacienda Bridge reaches 150 cfs. It is also assumed that the value of the optimal estuary inflow to balance the estuary elevation at 7.0 feet is 90 cfs. However, the operator will, in practice, consider the actual physical conditions in the estuary.

Once the lower Russian River minimum flow has been established, the operator will calculate the expected net SCWA demand at Wohler/Mirabel by subtracting the current tributary inflows from the current demands for the Santa Rosa subunit. Knowing the target flow for Dry Creek, the net demand at Wohler/Mirabel, the minimum flow at Hacienda Bridge, and the minimum flow at Healdsburg, the operator will calculate a target flow at Healdsburg (which may be greater or less than the minimum flow for Healdsburg). The operator then sets the release from Lake Mendocino high enough to either maintain the required minimum flows in the upper and middle Russian River (with an operating margin sufficient to allow for variables beyond the control of SCWA), or so that the anticipated demands between Coyote Valley Dam and Healdsburg will whittle the flow down to the target flow at Healdsburg, or the minimum flow, whichever is greater.

The operator does not know what the exact future demands and tributary inflows will be. Therefore the operator assumes the current demands and inflows will approximate the demands and inflows for three days into the future. Release rates from Lake Mendocino will not normally be changed more often that once every three days, to allow the upper and middle Russian River to approach a steady-state condition. This allows the operator to infer the current rate of consumptive uses between the Forks and Healdsburg from the differences in gauged flow rates.

The proposed water right permit terms allow an exception during Critical water supply conditions to increase flows in Dry Creek beyond the normal operational envelope. Thus, during that condition, the operator assumes a target flow from Dry Creek of 200 cfs, which communicates to the upper Russian River algorithm a reduced need for water from Coyote Dam, thereby conserving the water supply pool for upper and middle Russian River basin uses. Conversely, the October Dry Creek target flow under Normal water supply conditions is reduced from 70 to 50 cfs to so that the upper Russian River algorithm increases releases from Lake Mendocino to help purge the flood control pool and reduce a flow rate spike that would otherwise occur as the USACE assumes flood operations control of releases.

There is a biological sensitivity to increasing release rates from Lake Mendocino. These increasing releases needed to meet increased demands could eventually begin to degrade the salmonid rearing habitat in the upper Russian River. Consequently, one of the goals of the proposed flow regime is to balance releases from the two reservoirs to maintain flow levels in both the upper Russian River and Dry Creek that create good rearing

habitat for salmonids. To accomplish this, there is a flow rate envelope for the upper and middle Russian River. The envelope is defined by the upper and lower range of flow rates that provide a quality of flow-related habitat consistent with the needs of rearing juvenile salmonids. The upper flow rates are not appropriate as permit terms, but rather are operational goals that the SCWA will strive to meet as future demands increase. The lower range of the flow regulation envelope for the upper and middle Russian River are the minimum flows required by the proposed water rights permit terms listed in Table B-1. The upper boundary of the flow regulation envelope at Healdsburg is listed in Table B-3.

The operational goal of remaining within the flow envelope will be achieved by limiting the amount of Santa Rosa subunit demand that will be met through releases from Lake Mendocino. If necessary, the balance of the demand is then met by increasing the flow rate at the mouth of Dry Creek. In addition to protecting both the upper Russian River salmonid habitat, this also increases the reliability of the water supply in Lake Mendocino.

Table B-3 Healdsburg Upper Flow Envelope in cfs

Jun	Jul	Aug	Sep	Oct	Nov
200	180	160	140	140	170

B.4.0 Minimum Lake Sonoma Releases

The proposed flow regime specifies minimum flow rates for Dry Creek and for the lower Russian River. The Dry Creek minimum flow rates meet the migration and rearing habitat needs of juvenile salmonids in Dry Creek. The Dry Creek minimum flows are listed in Table B-4.

Table B-4 Minimum Stream Flow Requirements for Dry Creek in cfs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Normal	90	90	90	50	50	25	25	25	25	25	90	90
Dry	75	75	75	50	50	25	25	25	25	25	75	75
Critical	75	75	75	50	50	25	25	25	25	25	75	75

The required minimum flow rate for the lower Russian River generally is the natural flow at Hacienda Bridge. However, there is a specified absolute minimum flow rate of 35 cfs. All of the specified minimum flow rates at Hacienda Bridge refer to a five-day running average flow rate (with the instantaneous flow rate never less than 10 cfs below the specified minimum flow requirement). The natural flow of the Russian River at Hacienda Bridge (USGS gauging station Russian River near Guerneville) is defined as 11.77 times the four-day running average of the gauged flow of Austin Creek at the USGS gauging station Austin Creek near Cazadero, California. During periods in which that gauge is malfunctioning or otherwise not available, the natural flow is defined as 24.89 times the four-day running average of the gauged flow of Maacama Creek at the USGS gauging station Maacama Creek near Kellogg, California.

Releases from reservoir storage are not required to be made to maintain the natural flow rate once it rises above a specified "transition flow rate." The transition flow rates for the lower Russian River are listed in Table B-5.

Table B-5 Lower Russian River Transition Flow Rates in cfs

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Normal	125	125	125	150	150	125	125	125	125	125	125	125
Dry	125	125	125	150	150	125	125	125	125	125	125	125
Critical	35	35	35	35	35	35	35	35	35	125	125	125
Dry Spring	125	125	125	150	150	125	125	125	125	125	125	125

An exception to the lower Russian River minimum flow rate requirements applies in order to prevent flooding in the estuary without the need for artificial breaching. When the sand bar at the mouth of the river closes, the required minimum flow at Hacienda Bridge changes from either the natural flow rate or the transition flow rate, whichever is then governing, to a flow rate designated as the Optimal Estuary Inflow (OEI). The minimum required flow then remains at the OEI until the natural flow rate drops below the OEI. At that time, the natural flow rate once again becomes the required minimum flow rate until the natural flow rate declines to the floor value of 35 cfs, where the minimum flow rate remains until the natural flow rate increases back to the point it exceeds 35 cfs. The OEI is defined as the flow at Hacienda Bridge that will result in an estuary water surface elevation stabilized at 7.0 feet. The OEI has been estimated to be approximately 90 cfs. However, the OEI is not constant and changes throughout the year in response to ocean conditions.

B.5.0 Lake Sonoma Operating Criteria

Compared to the operation of Lake Mendocino, the operation of Lake Sonoma is relatively straightforward. The operator makes releases from Lake Sonoma at the rates necessary either to meet the required minimum flow rates listed in Table B-4 (with an operating margin sufficient to allow for variables beyond the control of the SCWA) or the governing minimum flow rate at Hacienda Bridge, whichever requires the larger release rate. During those periods when either the transition flow rates listed in Table B-5, or the absolute minimum flow rate of 35 cfs, governs releases, additional water will be releases at a rate sufficient to provide an operating margin sufficient to allow for variables beyond the control of the SCWA. Unlike at Lake Mendocino, where a change in the rate of release should only be made every three or four days, Lake Sonoma release rate changes can be made more frequently. Since the travel time to the SCWA's water transmission system intakes for water released from Lake Sonoma is much shorter that that released from Lake Mendocino, daily variations in the lower Russian River flows will be regulated with releases from Lake Sonoma.

B.6.0 Additional Measures

As was the case for the upper and middle Russian River, there is also a flow rate envelope for Dry Creek. The upper range of the flow envelope for Dry Creek is 90 cfs during Normal and Dry water supply conditions. There is no upper range during Critical

water supply conditions. The lower range of the flow regulation envelope for Dry Creek is the minimum flows required by the proposed water rights permit terms listed in Table B-4 (with an operating margin sufficient to allow for variables beyond the control of the SCWA).

Since releases must be made from Lake Sonoma at the rates necessary to meet the required lower Russian River minimum flow rates, the only means available to keep Dry Creek flow rates from exceeding the upper range of the flow envelope are physical facilities to limit the need for releases from Lake Sonoma to Dry Creek. These measures could consist of a number of different types of facilities. These include, but are not limited to, aquifer storage and recovery facilities to partially satisfy peak summer water transmission system demands, or a pipeline paralleling Dry Creek to divert water from Lake Sonoma and convey it to the Russian River downstream from the mouth of Dry Creek. While such measures are unnecessary under current water demand conditions, they likely will be necessary in the future.

A series of model runs were performed to define the additional measures that will be necessary in the future to maintain the desired flow levels. Based upon the results of these model studies, additional measures are planned to be constructed that will provide a continuous water supply flow rate during the months of June through September starting at 3 million gallons per day (MGD) when the SCWA water transmission system peak month demand reaches 83 MGD. Further measures are planned to be constructed in stages as shown in Table B-6. The model runs demonstrated that the timely construction of these measures will assure that the desired flow levels in Dry Creek and the upper and middle Russian Rivers will be able to be maintained under all projected future demand conditions.

Table B-6 Implementation Schedule for Additional Measures

SCWA Demand Level (MGD)	Additional Measures (MGD)
73	0
83	0
93	5
104	22
115	37

Flow Proposal
Proposed Water Rights Permit Terms
December 10, 2003

The following revisions to appropriative water rights permits held by the Agency are proposed to implement the flow proposal:

Permit 16596

Term 13 is to be amended to read as follows:

For the protection of fish and wildlife in Dry Creek and the Russian River, unless the elevation of the water level in Lake Sonoma is below 292.0 feet, with reference to the National Geodetic Vertical Datum of 1929, or unless prohibited by the United States Army Corps of Engineers acting under its reserved rights specified in the October 1, 1982 contract between permittee and the United States (or any successor agreement), permittee shall pass through, or release from storage at, Lake Sonoma sufficient water to maintain:

(A) The following minimum flow rates in Dry Creek between Warm Springs Dam and its confluence with the Russian River:

(1) During normal water supply conditions:

90 cfs from January 1 through March 31
50 cfs from April 1 through May 31
25 cfs from June 1 through October 31
90 cfs from November 1 through December 30

(2) During dry or critical water supply conditions:

75 cfs from January 1 through March 31
50 cfs from April 1 through May 31
25 cfs from June 1 through October 31
75 cfs from November 1 through December 31

(B) At the United States Geological Survey stream flow gauging station Russian River near Guerneville, California, to the extent such flows cannot be met by releases from storage at Lake Mendocino under Permit 12947A issued on Application 12919A, a five-day running average flow rate (with the instantaneous flow rate never less than 10 cfs below the specified minimum five-day running average flow requirement) that is the lesser of 1) the natural flow rate or 35 cfs, whichever is greater, and 2) the following flow rates:

(1) During normal and dry water supply conditions

125 cfs from October 1 through March 31
150 cfs from April 1 through May 31
125 cfs from June 1 through September 30

(2) During critical water supply conditions

125 cfs from October 1 through December 31
35 cfs from January 1 through September 30

provided, however, during those periods when the Russian River estuary is closed by a sand bar, permittee may reduce the flows at the United States Geological Survey stream flow gauging station Russian River near Guerneville, California below the minimum specified above, if, and to the extent that, such reductions are reasonably necessary so that the water surface elevation in the estuary will not exceed 7.0 feet, with reference to the National Geodetic Vertical Datum of 1929.

For the purposes of the requirements of this term, the following definitions shall apply:

(1) Dry water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

8,000 acre-feet as of January 1
39,200 acre-feet as of February 1
65,700 acre-feet as of March 1
114,500 acre-feet as of April 1
145,600 acre-feet as of May 1
160,000 acre-feet as of June 1

(2) Critical water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

4,000 acre-feet as of January 1
20,000 acre-feet as of February 1
45,000 acre-feet as of March 1
50,000 acre-feet as of April 1
70,000 acre-feet as of May 1
75,000 acre-feet as of June 1

(3) Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

(4) The water supply condition designation for the months of July through December shall be the same as the designation for the previous June. Water supply conditions for January through June shall be redetermined monthly.

(5) Cumulative inflow to Lake Pillsbury is the calculated algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury, and evaporation from Lake Pillsbury.

(6) The natural flow of the Russian River at the United States Geological Survey gauging station Russian River near Guerneville, California is defined as 11.77 times the four-day running average of the gauged flow of Austin Creek at the

United States Geological Survey gauging station Austin Creek near Cazadero, California. During periods in which this gauge is malfunctioning or otherwise not available, the natural flow is defined as 24.89 times the four-day running average of the gauged flow of Maacama Creek at the United States Geological Survey gauging station Maacama Creek near Kellogg, California. These flow ratios may be modified by permittee, upon written application by permittee, supported by at least five years of new stream flow records at the Austin Creek or Maacama Creek gauging stations, so that the above formulas will more accurately estimate the natural flow of the Russian River at the U.S. Geological Survey gauging station Russian River near Guerneville, California. In the preceding sentence, the "natural flow of the Russian River" is that flow that would occur in the Russian River at the referenced gauge if there were no imports of water into the Russian River basin, no releases of stored water and no diversions of water from the Russian River or any of its tributaries.

Permit 12947A

Term 18 is amended to read as follows:

For the protection of fish and wildlife, unless prohibited by the United States Army Corps of Engineers acting within its reserved rights under the water storage space agreement between permittee and the United States (or any successor agreement), permittee shall pass through or release from storage at Lake Mendocino sufficient water to maintain the following minimum flow rates:

(A) A continuous flow rate in the East Fork Russian River from Coyote Valley Dam to its confluence with the Russian River of 25 cfs at all times.

(B) In the Russian River between its confluence with the East Fork Russian River and its confluence with Dry Creek, the following five-day running average flow rates (with the instantaneous flow rate never less than 20 cfs below the specified five-day running average flow requirement):

(1) During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year exceeds 130,000 acre-feet or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

100 cfs from April 1 through May 31
50 cfs from June 1 through October 31
150 cfs from November 1 through March 31

provided, however, if anytime between November 1 through December 31, storage in Lake Mendocino is less than 30,000 acre-feet, then the required minimum flow rate shall be 75 cfs.

(2) During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 acre-feet or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

100 cfs from April 1 through May 31
50 cfs from June 1 through October 31
75 cfs from November 1 through December 31
150 cfs from January 1 through March 31

(3) During dry water supply conditions:

50 cfs from June 1 through October 31
75 cfs from November 1 through May 31

(4) During critical water supply conditions:

25 cfs during all months.

(C) At the United States Geological Survey stream flow gauging station Russian River near Guerneville, California, a five-day running average flow rate (with the instantaneous flow rate never less than 10 cfs below the specified minimum five-day running average flow requirement) that is the lesser of 1) the natural flow rate or 35 cfs, whichever is greater, and 2) the following flow rates:

(1) During normal and dry water supply conditions

125 cfs from October 1 through March 31
150 cfs from April 1 through May 31
125 cfs from June 1 through September 30

(2) During critical water supply conditions

125 cfs from October 1 through December 31
35 cfs from January 1 through September 30

provided, however, during those periods when the Russian River estuary is closed by a sand bar, permittee may reduce the flows at the United States Geological Survey stream flow gauging station Russian River near Guerneville, California below the minimum specified above, if, and to the extent that, such reductions are reasonably necessary so that the water surface elevation in the estuary will not exceed 7.0 feet, with reference to the National Geodetic Vertical Datum of 1929.

For the purposes of the requirements of this term, the following definitions shall apply:

(1) Dry water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

8,000 acre-feet as of January 1

39,200 acre-feet as of February 1
65,700 acre-feet as of March 1
114,500 acre-feet as of April 1
145,600 acre-feet as of May 1
160,000 acre-feet as of June 1

(2) Critical water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

4,000 acre-feet as of January 1
20,000 acre-feet as of February 1
45,000 acre-feet as of March 1
50,000 acre-feet as of April 1
70,000 acre-feet as of May 1
75,000 acre-feet as of June 1

(3) Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

(4) The water supply condition designation for the months of July through December shall be the same as the designation for the previous June. Water supply conditions for January through June shall be redetermined monthly.

(5) Cumulative inflow to Lake Pillsbury is the calculated algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury, and evaporation from Lake Pillsbury.

(6) Estimated water supply storage capacity is the reservoir volume below elevation 1,828.3 feet in Lake Pillsbury and below elevation 749.0 feet in Lake Mendocino. Both elevations refer to the National Geodetic Vertical Datum of 1929. The volume shall be determined using the most recent reservoir volume surveys made by the U.S. Geological Survey, U.S. Army Corps of Engineers, or other responsible agency.

(7) The natural flow of the Russian River at the United States Geological Survey gauging station Russian River near Guerneville, California is defined as 11.77 times the four-day running average of the gauged flow of Austin Creek at the United States Geological Survey gauging station Austin Creek near Cazadero, California. During periods in which this gauge is malfunctioning or otherwise not available, the natural flow is defined as 24.89 times the four-day running average of the gauged flow of Maacama Creek at the United States Geological Survey gauging station Maacama Creek near Kellogg, California. These flow ratios may be modified by permittee, upon written application by permittee, supported by at least five years of new stream flow records at the Austin Creek or Maacama Creek gauging stations, so that the above formulas will more accurately estimate the natural flow of the Russian River at the U.S. Geological Survey gauging station Russian River near Guerneville, California. In the preceding sentence, the “natural flow of the Russian River” is that flow that would occur in the Russian River at the referenced gauge if there were no

imports of water into the Russian River basin, no releases of stored water and no diversions of water from the Russian River or any of its tributaries.

Permit 12949

Term 15 is amended to read as follows:

For the protection of fish and wildlife, and the maintenance of recreation in the Russian River, permittee shall allow sufficient water to bypass the points of diversion to maintain the following minimum flows at the Russian River at the United States Geological Survey gauging station Russian River near Guerneville, California:

A five-day running average flow rate (with the instantaneous flow rate never less than 10 cfs below the specified minimum five-day running average flow requirement) that is the lesser of 1) the natural flow rate or 35 cfs, whichever is greater, and 2) the following flow rates:

(1) During normal and dry water supply conditions

125 cfs from October 1 through March 31
150 cfs from April 1 through May 31
125 cfs from June 1 through September 30

(2) During critical water supply conditions

125 cfs from October 1 through December 31
35 cfs from January 1 through September 30

provided, however, during those periods when the Russian River estuary is closed by a sand bar, permittee may reduce the flows at the United States Geological Survey stream flow gauging station Russian River near Guerneville, California below the minimum specified above, if, and to the extent that, such reductions are reasonably necessary so that the water surface elevation in the estuary will not exceed 7.0 feet, with reference to the National Geodetic Vertical Datum of 1929.

For the purposes of the requirements of this term, the following definitions shall apply:

(1) Dry water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

8,000 acre-feet as of January 1
39,200 acre-feet as of February 1
65,700 acre-feet as of March 1
114,500 acre-feet as of April 1
145,600 acre-feet as of May 1
160,000 acre-feet as of June 1

(2) Critical water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

4,000 acre-feet as of January 1
20,000 acre-feet as of February 1
45,000 acre-feet as of March 1
50,000 acre-feet as of April 1
70,000 acre-feet as of May 1
75,000 acre-feet as of June 1

(3) Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

(4) The water supply condition designation for the months of July through December shall be the same as the designation for the previous June. Water supply conditions for January through June shall be redetermined monthly.

(5) Cumulative inflow to Lake Pillsbury is the calculated algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury, and evaporation from Lake Pillsbury.

(6) The natural flow of the Russian River at the United States Geological Survey gauging station Russian River near Guerneville, California is defined as 11.77 times the four-day running average of the gauged flow of Austin Creek at the United States Geological Survey gauging station Austin Creek near Cazadero, California. During periods in which this gauge is malfunctioning or otherwise not available, the natural flow is defined as 24.89 times the four-day running average of the gauged flow of Maacama Creek at the United States Geological Survey gauging station Maacama Creek near Kellogg, California. These flow ratios may be modified by permittee, upon written application by permittee, supported by at least five years of new stream flow records at the Austin Creek or Maacama Creek gauging stations, so that the above formulas will more accurately estimate the natural flow of the Russian River at the U.S. Geological Survey gauging station Russian River near Guerneville, California. In the preceding sentence, the "natural flow of the Russian River" is that flow that would occur in the Russian River at the referenced gauge if there were no imports of water into the Russian River basin, no releases of stored water and no diversions of water from the Russian River or any of its tributaries.

Permit 12950

Term 15 is amended to read as follows:

For the protection of fish and wildlife, and the maintenance of recreation in the Russian River, permittee shall allow sufficient water to bypass the points of diversion to maintain the following minimum flows at the Russian River at the United States Geological Survey gauging station Russian River near Guerneville, California:

A five-day running average flow rate (with the instantaneous flow rate never less than 10 cfs below the specified minimum five-day running average flow requirement) that is the lesser of 1) the natural flow rate or 35 cfs, whichever is greater, and 2) the following flow rates:

(1) During normal and dry water supply conditions

125 cfs from October 1 through March 31
150 cfs from April 1 through May 31
125 cfs from June 1 through September 30

(2) During critical water supply conditions

125 cfs from October 1 through December 31
35 cfs from January 1 through September 30

provided, however, during those periods when the Russian River estuary is closed by a sand bar, permittee may reduce the flows at the United States Geological Survey stream flow gauging station Russian River near Guerneville, California below the minimum specified above, if, and to the extent that, such reductions are reasonably necessary so that the water surface elevation in the estuary will not exceed 7.0 feet, with reference to the National Geodetic Vertical Datum of 1929.

For the purposes of the requirements of this term, the following definitions shall apply:

(1) Dry water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

8,000 acre-feet as of January 1
39,200 acre-feet as of February 1
65,700 acre-feet as of March 1
114,500 acre-feet as of April 1
145,600 acre-feet as of May 1
160,000 acre-feet as of June 1

(2) Critical water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

4,000 acre-feet as of January 1
20,000 acre-feet as of February 1
45,000 acre-feet as of March 1
50,000 acre-feet as of April 1
70,000 acre-feet as of May 1
75,000 acre-feet as of June 1

(3) Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

(4) The water supply condition designation for the months of July through December shall be the same as the designation for the previous June. Water supply conditions for January through June shall be redetermined monthly.

(5) Cumulative inflow to Lake Pillsbury is the calculated algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury, and evaporation from Lake Pillsbury.

(6) The natural flow of the Russian River at the United States Geological Survey gauging station Russian River near Guerneville, California is defined as 11.77 times the four-day running average of the gauged flow of Austin Creek at the United States Geological Survey gauging station Austin Creek near Cazadero, California. During periods in which this gauge is malfunctioning or otherwise not available, the natural flow is defined as 24.89 times the four-day running average of the gauged flow of Maacama Creek at the United States Geological Survey gauging station Maacama Creek near Kellogg, California. These flow ratios may be modified by permittee, upon written application by permittee, supported by at least five years of new stream flow records at the Austin Creek or Maacama Creek gauging stations, so that the above formulas will more accurately estimate the natural flow of the Russian River at the U.S. Geological Survey gauging station Russian River near Guerneville, California. In the preceding sentence, the "natural flow of the Russian River" is that flow that would occur in the Russian River at the referenced gauge if there were no imports of water into the Russian River basin, no releases of stored water and no diversions of water from the Russian River or any of its tributaries.

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